

Patent Claims

1. A recombination device (1, 1') for the catalytic recombination of hydrogen and/or carbon monoxide with oxygen in a gaseous mixture, for which at least one catalyst system (2) is arranged inside a housing (4) through which the gaseous mixture flows during the operational phase, wherein the catalyst system (2) is provided with several sub regions (T1, T2) in flow direction of the gaseous mixture,

characterized in that in the inflow direction, a first sub region (T1) comprises a catalyst body (6) with surrounding retarding layer (8) for inhibiting the diffusion of the reaction gases flowing in and/or out and that a second sub region (T2) that adjoins the first sub region (T1) comprises at least one catalyst body (6), to which the reaction gases have direct access.

2. A recombination device (1, 1') according to claim 1, **characterized in that** the catalyst body (6) in the second sub region (T2) has a higher activity than the catalyst body (6) in the first sub region (T1).

Sub
A,
3. A recombination device (1, 1') according to claim 1 or 2, **characterized in that** the catalyst body (6) in the second sub region (T2) comprises a plate-shaped sheet metal carrier that is coated with a catalyst material.

4. A recombination device (1, 1') according to claim 3, **characterized in that** the catalyst material contains a catalytic precious metal, in particular platinum or palladium.

Sub A2

5. A recombination device (1') according to one of the claims 1 to 4,
characterized in that the retarding layer (8) in the first sub region (T1) in particular is a porous layer composed of a bulk material, in which the catalyst body (6) is arranged.

6. A recombination device (1) according to one of the claims 1 to 4,
characterized in that the retarding layer (8) in the first sub region (T1) is deposited as porous cover layer onto the catalyst body (6).

7. A recombination device (1) according to one of the claims 1 to 6,
characterized in that several identical catalyst systems (2) are arranged parallel to each other.

8. A recombination device (1) according to claim 7,
characterized in that the catalyst systems (2) have a plate-shaped design with a respective total thickness of maximum 1 cm, preferably 0.3 mm, and that they are arranged side-by-side, at a distance of less than 20 mm.

Sub A3

9. A recombination device (1, 1') according to one of the claims 1 to 8,
characterized in that an up-current protection (10) is provided at the front end of the catalyst system (2), in inflow direction of the gaseous mixture.

10. A recombination device (1, 1') according to one of the claims 1 to 9,
characterized in that a down current protection (12) is arranged in outflow direction of
the gaseous mixture, at the end of the catalyst system (2).

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

11. A method for catalytically recombining hydrogen and/or carbon monoxide with oxygen in a gaseous mixture, for which the gaseous mixture is supplied to a catalyst body (6) for starting the recombination reaction, wherein only a partial amount of the gaseous mixture comes in contact with the catalyst body (6) in a first sub region (T1) in flow direction and wherein the catalyst body (6) is subjected completely to the gaseous mixture only in a second sub region (T2).

12. A method according to claim 11,
characterized in that in the first sub region (T1) the hydrogen content of the gaseous mixture is reduced through oxidation to less than 5% by volume.

13. A method according to claim 11,
characterized in that the complete gaseous mixture in the first sub region (T1) is guided over a retarding layer (8).

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14. A method according to one of the claims 11 to 13,
characterized in that the partial amount of the gaseous mixture is adjusted such that the reaction temperature (T) in the first partial region (T1) is lower than in the second partial region (T2).

15. A method according to one of the claims 11 to 14,
characterized in that the partial amount of the gaseous mixture is adjusted such that in
the first sub region (T1) the reaction temperature (T) is lower than 560 °C and/or in the
second sub region (T2), the reaction temperature is higher than 560 °C.

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